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## 症 例

# Left Atrial Myxoma With Embolic Episodes —A Case Report—

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### Introduction

A 17-year-old student experienced three embolic episodes of the lower extremities. At the third episode, left atrial myxoma was diagnosed from echocardiographic findings. It was successfully removed by open heart surgery. In this paper, the cardiac source of peripheral embolism and its diagnosis is discussed. Echocardiography is the most useful technique for the diagnosis of intracardiac myxoma. Echocardiographic screening is necessary for the patient with peripheral embolic episodes. Left atrial myxoma should be suspected especially when a young patient with an embolic episode has no specific findings from ECG and chest X-ray, and echocardiography should be done. Surgical removal must be performed as soon as possible after the diagnosis of a myxoma is established.

### Case Report

The patient, N.K. was a 17-year old male student. He had no definite history of rheumatic fever.

In May, 1977, when he was 13 years old, he suddenly suffered from a cold sensation and

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numbness of the right leg at rest. The former disappeared spontaneously within three days. But numbness and contracture of the right toes remained longer, which necessitated rehabilitation therapy for about a month.

In January, 1978, he fell down while running due to sudden numbness and motor disturbance of the both legs, and was admitted to a hospital. His signs and symptoms were mainly paralysis of the legs, severe lumbosacral pain, anesthesia or paresthesia of L5-S5, urinary retention and paralytic ileus. On laboratory examination, the values of GOT, LDH and CPK were high. He was strongly suspected of having an arteriovenous malformation of the spinal cord. But myelography was performed without abnormal findings. He was hospitalized for three months, and his signs and symptoms improved gradually. The diagnosis was the transverse myelopathy of unknown etiology. After discharge he enjoyed normal school life.

On December 2, 1981, he suddenly suffered from muscular clamps in the right leg while playing basketball, and was referred to our hospital three hours later. He complained of severe and unremitting pain in the right leg. Pulse was 60 beats/min. and regular. Blood pressure was 160/80 mmHg. Pulsation of the right femoral artery was well palpable, but it was impossible to palpate the right popliteal, dorsalis pedis or posterior tibial arteries. The skin of the right leg was pale and cold. He could move his right leg and foot. However, his right toes were in the paralytic flexion position. He had no specific findings from ECG or chest X-ray.

He was diagnosed as right femoral embolism. Emergency embolectomy was performed six hours after the onset. The right groin was incised and the common femoral artery was exposed. Using Fogarty's catheter, three gelatinous emboli were removed from the right common and superficial femoral, and popliteal arteries (Fig. 1). It was presumed that they were the fragments of myxoma originating in the heart. On the intraoperative angiography (Fig. 2), the anterior and posterior tibial arteries were obstructed at the midpoint. These emboli could

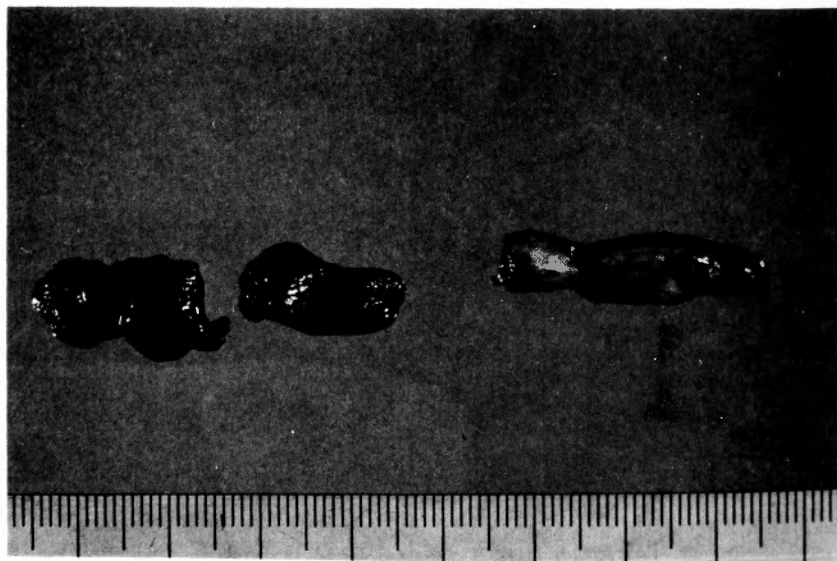
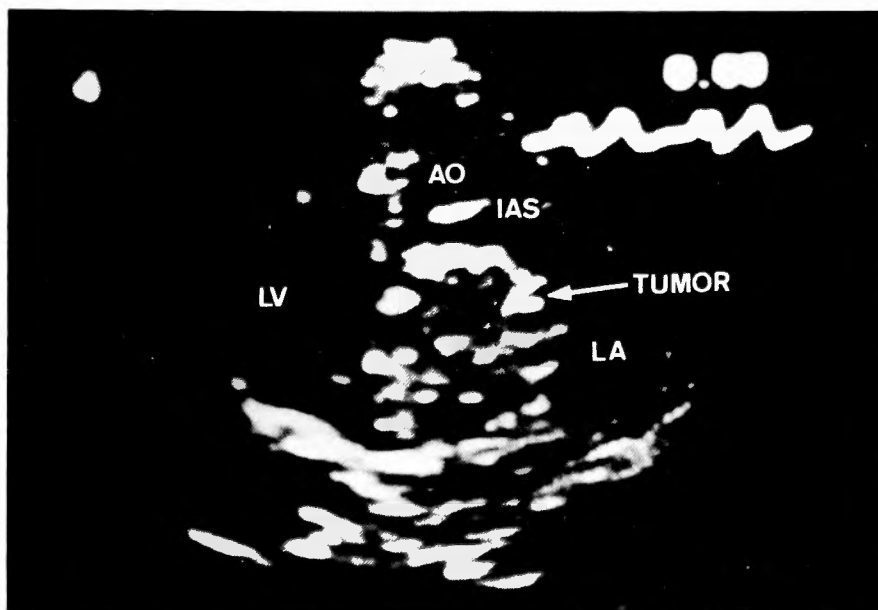


Fig. 1. The removed emboli from the peripheral arteries



**Fig. 2.** Intraoperative angiogram The arrows show the obstruction of arteries.

not be removed in spite of repeated efforts. Immediately after the operation, pulsation of posterior tibial artery was restored but that of dorsalis pedis artery was not palpated. The right leg became warm. At admission, abnormal heart sounds were not noticed. However, with



**Fig. 3-a.** Two-dimensional echocardiography (diastolic phase)

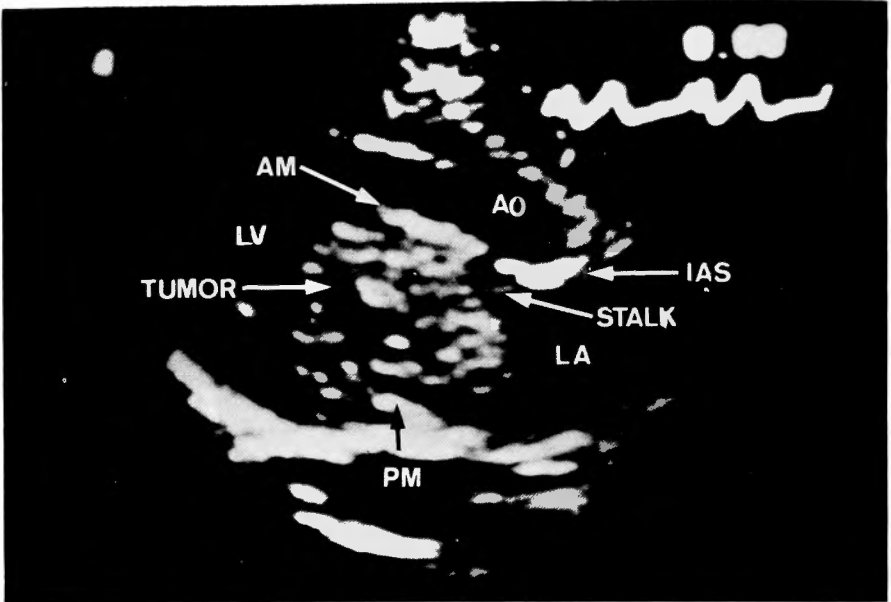


Fig. 3-b. Two-dimensional echocardiography (systolic phase)

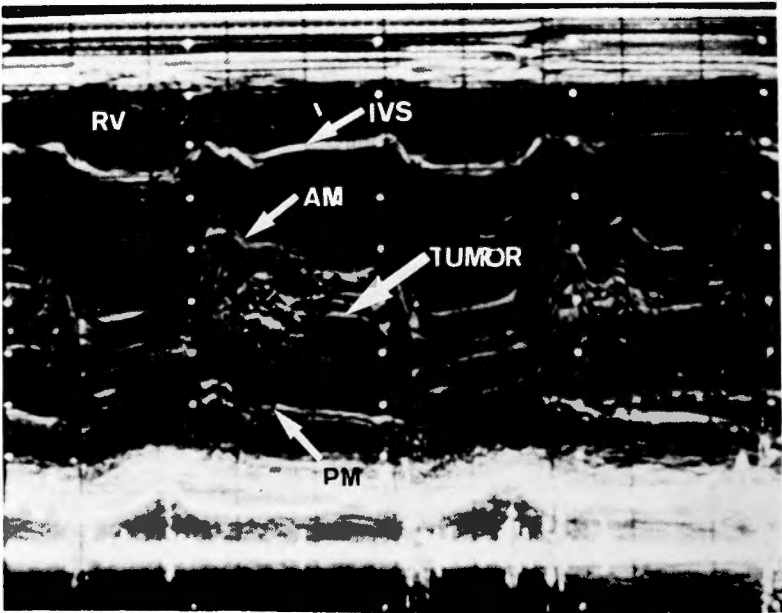


Fig. 3-c. M-mode echocardiography

Tumor occupies almost the left atrial cavity during systole. It prolapses to the left ventricle through the mitral valve during diastole. Stalk is seen behind the interatrial septum: AM=anterior cusp of mitral valve, Ao=Aortic root, IAS=interatrial septum, IVS=inter-ventricular septum, LA=left atrium, LV=left ventricle, PM=posterior cusp of mitral valve, RV=right ventricle

Careful auscultation following embolectomy, strong first heart sound, an early diastolic sound (so-called "tumor plop") and the following middiastolic rumble were recognized at the apex. These findings strongly suggested the presence of the myxoma in the left atrium, and supported the operative diagnosis.

On December 3, fasciotomy was performed for the purpose of relieving the postischemic edema. The severe and unremitting pain in the right leg was also relieved.

On December 4, echocardiography was performed (Fig. 3). The echo-producing mass occupied almost the entire left atrial cavity during systole, and moved into the left ventricle during diastole. The echo of the stalk was recognized posterior to the interatrial septum. This tumor was well movable and had several daughter tumors at its tip. We assumed that daughter tumors like these broke free from the main tumor and caused the peripheral embolism. Because of daughter tumors still present, it was suspected that systemic embolism could recur in the near future.

Heparin was administered in doses of 10,000 to 20,000 units intravenously every day to prevent the extension of the peripheral thromboembolism. Histologically, the emboli proved to be of myxomatous tissue. They had a loose myxoid stroma with stellate or fusiform cells (Fig. 4).

On December 17, he was operated on for the removal of the left atrial myxoma. A mid-sternotomy was accomplished and the cardiopulmonary bypass was instituted in the usual manner. Dubost's atrioseptal incision was made and both atria were opened. The interatrial septum was incised towards the fossa ovalis and the attachment of the stalk was identified (Fig. 5). The myxoma was removed en bloc with its attachment to the interatrial septum. The defect of the interatrial septum was closed with a Dacron patch. The cardiopulmonary bypass was weaned and the chest was closed. The removed myxoma was lobular with polypoid projections

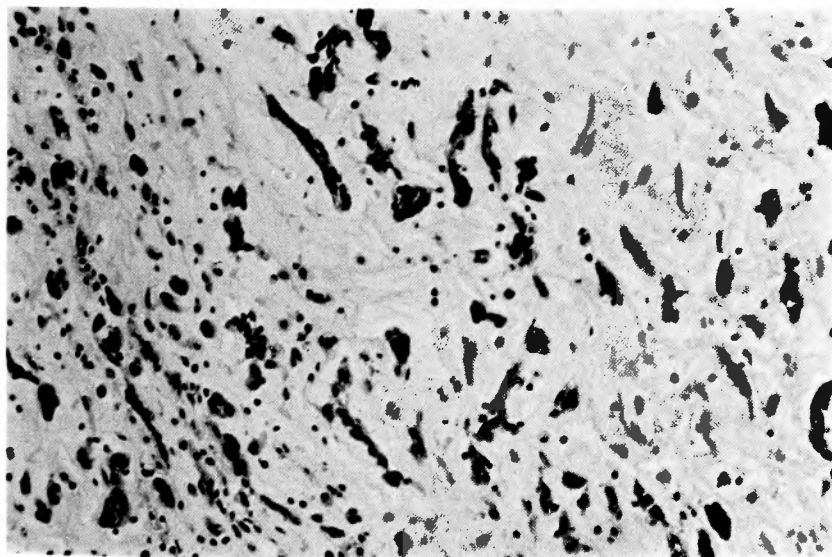
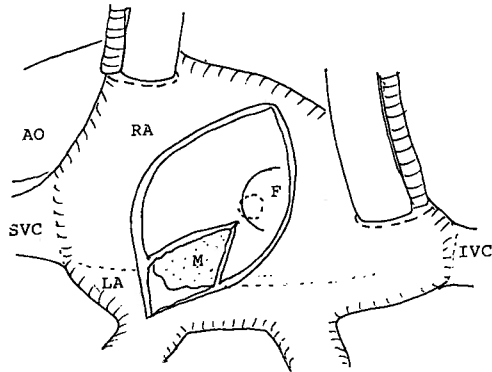


Fig. 4. Photomicrograph



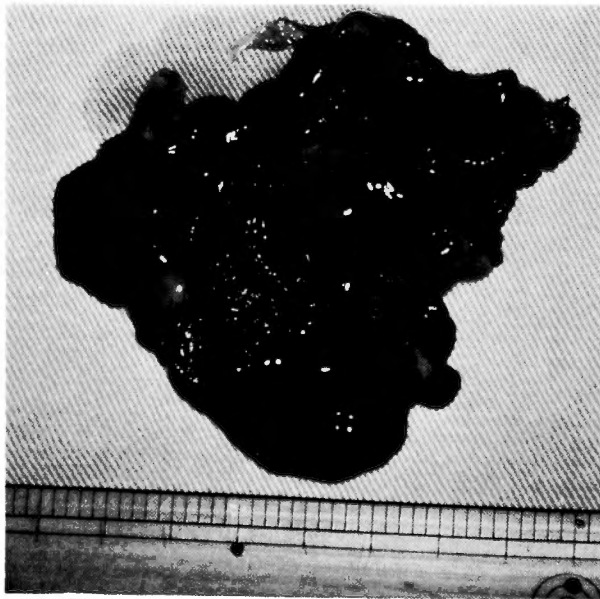
**Fig. 5.** Dubost' atrioseptal incision. Myxoma is seen in LA. Stalk is attached to the dotted circle.  
F=Fossa ovalis, M=Myxoma

and weighed 45 g (Fig. 6). Histologically, it was the same as the embolus. No invasion of the myxoma cells into the interatrial septum was identified.

The postoperative course was uneventful. The heart sounds became clear. The peroneal nerve paralysis (drop foot) remained. After he started rehabilitation therapy, the peroneal nerve paralysis improved gradually. He was discharged from the hospital on January 22, 1982.

### Discussion

Peripheral arterial embolism has five prominent features: they are pain, paralysis, paresthesia, pallor and absence of pulses. At the third episode, the patient had all these clinical features.



**Fig. 6.** Gross photograph of the removed myxoma

At the second episode, he had just three of these; that is pain, paralysis and paresthesia. Pallor and the absence of the dorsalis pedis artery pulse were not described. However, muscle damage was present, since the value of CPK was high. He felt that the second episode was almost the same as the third. Therefore, it is probable that the second episode was a bilateral arterial occlusion of the lower extremities. And it was felt that the paralytic ileus and the urinary retention were the features of the mesenteric involvement. At the first episode, cold sensation, numbness and contracture were felt to be the same as pallor, paresthesia and a sequela of paralysis. It is probable that he experienced three embolic episodes due to the left atrial myxoma.

Generally, the heart is the most common source of peripheral arterial embolism. The reported incidence of the cardiac source varies from seventy to ninety percent<sup>3,4</sup>. Rheumatic heart disease and arteriosclerotic heart disease are common sources of thromboembolism, particularly when associated with left atrial enlargement, atrial fibrillation or flutter. Myocardial infarction is one of the causes of embolism. Infective endocarditis must be considered in patients with acute arterial occlusion. A prosthetic aortic or mitral valve is also a possible source in spite of administration of anticoagulants. In addition, myxoma of the left heart must be considered although its incidence is rare<sup>2</sup>.

Seventy percent of emboli ejected from the heart lodge in the arteries of the lower extremities<sup>3,5</sup>. Twenty to twenty-five percent lodge in the cerebral arteries. Fortunately, the patient had not experienced cerebral infarction. Three episodes were all embolization of the lower extremities.

Although primary cardiac tumors are uncommon, cardiac myxomas comprise 50% of all primary cardiac tumors. About 75% of cardiac myxomas are found in the left atrium, 20% in the right atrium, and 5% in the ventricles<sup>1</sup>. They occur three times as often in women as in men. They are generally solitary and arise from a stalk on or near the fossa ovalis. Small myxomas are hemodynamically silent and can be discovered if they embolize or become infected. Medium-sized left atrial myxomas frequently cause obstruction to the blood flow and are confusing with the mitral stenosis. The classic auscultatory findings are changing cardiac murmurs and early diastolic tumor plop. But usually, they are not heard before the diagnosis is established.

About 40 to 60 percent of patients with left atrial myxomas have systemic emboli. Paradoxical embolism via the patent foramen ovale have been reported in patients with right atrial myxoma. Pulmonary emboli occur less frequently with right atrial or ventricular myxomas<sup>6</sup>.

Echocardiography is the most useful noninvasive technique for the diagnosis of cardiac myxomas<sup>4</sup>. In earlier periods, cardiac myxomas were discovered at autopsy or during the operation for mitral valve disease. After the introduction of the echocardiographic technique, myxomas could be diagnosed before the operation. This patient had typical echocardiographic findings<sup>4</sup>, and echocardiography is the only diagnostic technique for detecting the presence of left atrial myxoma. Echocardiographic screening is necessary for the patients with peripheral embolic episodes. Left atrial myxoma should be suspected especially when a young patient with an embolic episode has no specific findings from ECG and chest X-ray, and echocardiography should be done. A mortality rate of 8 to 10 percent has been reported among patients awaiting



surgery<sup>7)</sup>. Surgical removal must be performed as soon as possible after the diagnosis of a myxoma is established.

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### 和文抄録

## 塞栓症を起こした左房粘液腫

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上本 伸二, 日笠 頼則

17才の学生が, 下肢の塞栓症のエピソードを3回経験した。3回目のエピソードの際, 左房粘液腫が心エコー図により診断された。左房粘液腫は開心術により摘出された。この論文では末梢塞栓症の心由来の原因および診断について議論されている。心エコー図は心内粘液腫の診断にもっとも有効な非侵襲的検査法であ

る。末梢塞栓症の患者には心エコー図検査が必要である。特に, 塞栓症のエピソードのある若年の患者が心電図および胸部レントゲン写真に変化を認めない場合には, 左房粘液腫を疑い, 心エコー図検査を行なうべきである。粘液腫の診断がついた時には, できるだけ早期に外科的摘出を行わなければならない。